

ABSTRACT

The work aims at developing farming system alternatives for the Narayangarh community development block situated in the district of Midnapore, State of West Bengal, India. An approach for developing technically sound and optimal farming system alternatives at micro level within the existing natural and manpower resources is suggested. Agricultural production in India usually takes place under conflicting and non-commensurable situations of farmer's and government policies. Seven alternative systems were developed during the study and the planning problems were solved using systems engineering techniques namely linear programming, fuzzy linear programming and game and decision theory. Specifically, five single objective and two multiobjective models were developed considering the aspirations of the farmers and the government. The seven alternative farming systems were compared on various aspects and the best alternative systems was selected. Sensitivity analysis was done for the recommended system to provide policy measures to the development authority to make it implementable. Further, a simple management decision on water use was attempted to improve the recommended system still further.

The results revealed that the existing farming system was not meeting the food and nutritional requirements of the population and the per capita income of the block is Rs.1081.73 which is just half of the national figure of

Rs.2201.00. The existing fertilizer availability and usage was the limiting factor for cultivation of HYV in addition to the investment constraint. All other resources within the system were available in surplus to facilitate an optimal and intensive farming system alternative. Among the techniques attempted, the technique developed using game and decision theory was found to be the best to develop superior farming system alternative at the micro level making the most judicious use of natural and manpower resources. No doubt, the system developed using the objective of maximising the net returns provided a better deal to the farmer, keeping his responsibility to the nation and the benefits derived from the nation by way of fertilizers, investments and water, the compromise solution obtained using game and decision theory is recommended. According to the suggested system, the farming community will meet all their food and nutritional requirements and raise their per capita income to Rs.2660.35. The same system could provide a per capita income of Rs.2932.98 when water management practice was followed. The implementation of the recommended alternative farming system is viable because of minimal investment, better benefit to cost ratio and above all more cropped area in rabi.

Key words : Farming system alternatives, system design, community development block, single and multi-objective programming techniques, management decision.